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**PATENT SPECIFICATION** (21) **22,225** /67

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Lodged (22) 24th May, 1967.

Complete Specification  
entitled (54) **PRESSURE OPERABLE VALVES.**

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Related Art (56)	218,993(29,857/57)	61.7; 74.7.
	157,240(11,472/52)	74.7; 61.7; 78.73.
	284,311(40,814/64)	74.7; 665

The following statement is a full description of this invention, including the best method of performing it known to me:

1962/71-4

W. G. Menzies, Government Printer, Canberra

111-1D-21/10/71-15P. C.

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This invention relates to fluid pressure operable valves for use in fluid systems.

In certain fluid systems such, for example, as petrol injection systems of internal combustion engines it is desirable to permit of the escape of air from the system before normal operation commences, and to provide for the escape of fluid if the pressure in the system rises above a predetermined value.

The object of the present invention is to provide in a convenient form a single valve which will permit of both these desiderata.

A valve according to the invention comprises in combination a hollow body having an inlet and an outlet, a first seating in the body between the inlet and outlet, a hollow member slidable in the body, said hollow member being resiliently urged away from the first seating, a second seating on the hollow member, and a second member resiliently urged towards the second seating, the arrangement being such that when the pressure at the inlet is below a lower predetermined value fluid can flow from the inlet to the outlet, but when said lower predetermined value is reached the hollow member will close on the first seating to prevent escape of fluid until a higher predetermined pressure is reached at which the second member will be lifted from the second seating.

Examples of the invention will now be described with reference to the accompanying drawings in which Figures 1, 2, 3 and 4 respectively show in sectional elevation four alternative forms of valve, like references being used for similar parts in the four Figures.

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Referring first to the example illustrated in Figure 1, there is provided a tubular body part 10 which is externally screw-threaded at its ends for connection within a fluid system. Within the body part is a step against which is located a sealing ring 11 constituting a seating for a cylindrical sleeve 12 slidable within the body part between the seating and a retaining ring 13 screw threaded into engagement with the inlet end of the body 10. The retaining ring 13 has flutes 13a at its side presented to the sleeve 12. Moreover, a substantial clearance (indicated at 14) is provided between the sleeve 12 and the body part.

The interior of the sleeve 12 has a conical step which constitutes a seating for a valve closure member in the form of a ball 15 and a coiled compression spring 16 acting on the ball urges the latter against its seating and also urges the sleeve 12 into the position shown.

When the pressure at the inlet is below a lower predetermined value fluid can flow from the inlet between the flutes 13a and through the clearance 14 to the outlet. However, when the lower predetermined pressure is exceeded, the sleeve 12 will move against the action of the spring into contact with the seating 11 thereby interrupting the flow of fluid to the outlet until the pressure reaches a higher predetermined value. If and when this higher predetermined value is reached the member 15 will be lifted from its seating to enable fluid to escape to the outlet, the valve then acting as a common relief valve.

The valve illustrated in Figure 2 differs essentially from that shown in Figure 1 only in that the member 15 is in the form of a poppet valve which is held upon the seating at the end of the sleeve 12 by means of a coiled compression spring 16 within the sleeve and re-acting at one end of an internal shoulder of the sleeve and at its other end upon an

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abutment collar 17 slidable within the sleeve. Moreover, in this construction the sleeve 12 is loaded by a second spring 16a. A further modification of this construction is that the retaining ring 13 is in the form of a split resilient ring engaging a groove within the internal periphery of the body 10.

The modification illustrated in Figure 3 of the drawings differs from that illustrated in Figure 1 only in that the spring 16 (which as in Figure 1 loads both the sleeve 12 and the member 15) is in the form of a coiled tension spring acting between a stirrup on the member 15 and an anchoring nut 18 in screw-threaded engagement with a stem extending from an apertured washer 19 bearing upon the retaining ring 13 which is again in the form of a split resilient ring.

The modification illustrated in Figure 4 differs essentially from that shown in Figure 1 only in that the member 15 is in the form of a poppet valve having a cylindrical stem portion 15a which is slidable within a fluted portion of the sleeve 12. Moreover, the abutment for the end of the spring 16 remote from the member 15 is a hollow plug 20 in screw-threaded engagement with the body 10.

It will be understood that the operation of the valves illustrated in Figures 2, 3 and 4 is similar to that described in relation to Figure 1.

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The claims defining the Invention are as follows:-

1. A fluid pressure operable valve comprising in combination a hollow body having an inlet and an outlet, a first seating in the body between the inlet and outlet, a hollow member slidable in body, said hollow member being resiliently urged away from the first seating, a second seating on the hollow member, and a second member resiliently urged towards the second seating, the arrangement being such that when the pressure at the inlet is below a lower predetermined value fluid can flow from the inlet to the outlet, but when said lower predetermined value is reached the hollow member will close on the first seating to prevent escape of fluid until a higher predetermined pressure is reached at which the second member will be lifted from the second seating.
2. A fluid pressure operable valve as claimed in Claim 1 in which a single resilient means serves to urge the hollow member away from the first seating and the second member towards the second seating.
3. A fluid pressure operable valve as claimed in Claim 1 or claim 2 in which the hollow member is in the form of a cylindrical sleeve shaped to define a seating for the second member.
4. A fluid pressure operable valve comprising the combination and arrangement of parts substantially as described and illustrated by Figure 1, Figure 2, Figure 3 or Figure 4 of the accompanying drawings.

DATED this 23rd day of MAY, A.D. 1967.

JOSEPH LUCAS (INDUSTRIES) LIMITED

By its Patent Attorneys

PHILLIPS ORMONDE LePLASTRIER & KELSON.

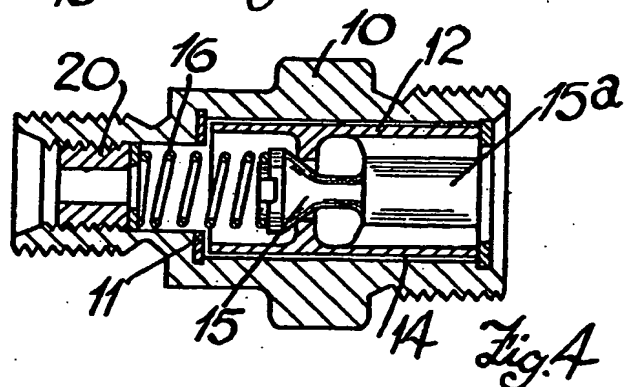
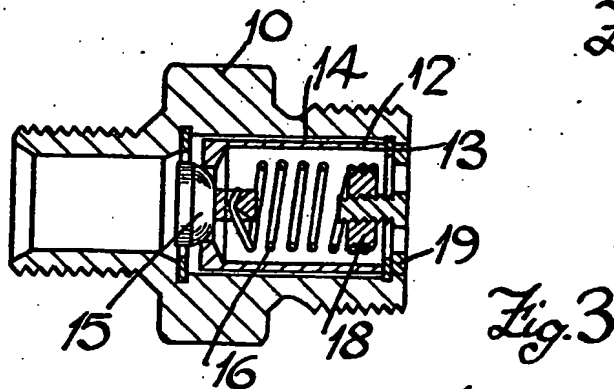
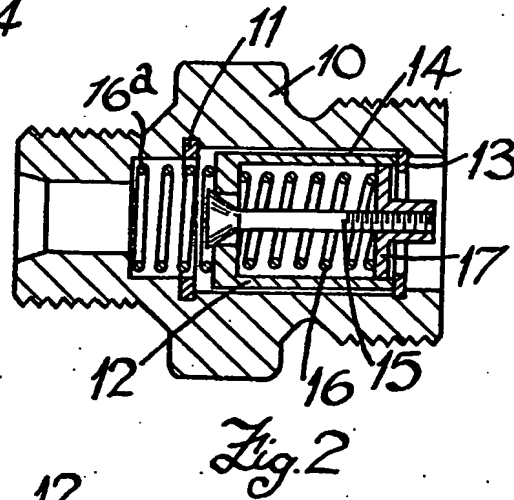
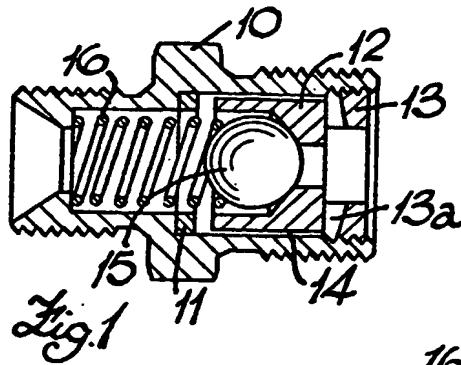
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